

INGE UYTTERHOEVEN

FEMKE MARTENS

BRANKO MUŠIČ

MARC WAELKENS<sup>1</sup>

## URBAN HOUSING IN THE PISIDIAN TOWN OF SAGALASSOS (BURDUR, TURKEY)

### Introduction

The Pisidian town of Sagalassos is located about 100 km to the north of Antalya (Southwest Turkey) and is situated in the Taurus Mountains, on a south facing mountain slope at about 1400 to 1600 m above sea-level<sup>2</sup>. Since 1990 the ancient city and its territory have been the subject of systematic interdisciplinary research under the direction of M. Waelkens of the Katholieke Universiteit Leuven (Belgium)<sup>3</sup>. This investigation has allowed to reconstruct the general process of urbanisation of Sagalassos from the Hellenistic period until the late 7<sup>th</sup> c. AD.

According to Arrian<sup>4</sup>, Alexander the Great conquered Sagalassos in 333 BC. At that time the town already formed one of the three major urban centres of Pisidia<sup>5</sup>. In 129 BC Sagalassos was incorporated into the *Provincia Asia* and thus entered the Roman World. The town became part of the new Imperial *Provincia Galatia* in 25 BC. The city underwent a first main development phase in the Augustan period, while public building activities reached a new climax during the 2<sup>nd</sup> c. AD, when Sagalassos referred to itself as ›First City of Pisidia, Friend and Ally of the Romans‹ (IGR III, 348)<sup>6</sup>.

Aside from the trade of agricultural products from its fertile territory, the prosperity of Imperial Sagalassos was for an important part based on the export of the local Sagalassos Red Slip Ware, whereby the already existing local potters' craft was reorganised at the level of a manufactory from the Augustan Period onwards, with a production intended for supra-regional and international trade<sup>7</sup>. In Late Antiquity Sagalassos continued

<sup>1</sup> I. Uytterhoeven and F. Martens are both Post-Doctoral Fellows of the Research Council – Flanders (Belgium) connected with the Sagalassos Archaeological Research Project, which is directed by M. Waelkens (Katholieke Universiteit Leuven – Belgium). B. Mušič is researcher and lecturer in Geophysics and Natural Sciences in Archaeology at the Department of Archaeology of the University of Ljubljana (Slovenia).

<sup>2</sup> Sagalassos seems to have partly co-existed with another urban centre at Düzen Tepe, which was situated upon a large plateau about 1.8 km to the southwest of Sagalassos. However, the chronology of this site (5<sup>th</sup>–2<sup>nd</sup> c. BC) as well as its relation to Sagalassos is currently still under investigation. See H. VANHAVERBEKE – M. WAELKENS – K. VYNCKE – V. DE LAET – S. AYDAL – B. MUŠIČ – B. DE CUPERE – D. BRAEKMANS – P. DEGRYSE – E. MARINOVA – J. POBLOME – G. VERSTRAETEN – W. VAN NEER – B. ŠLAPŠAK – I. MEDARIC – H. A. EKINCI – M. O. ERBAY, *Emerging Urbanism in Pisidia (Southwest Anatolia). The Origins of Sagalassos at Düzen Tepe*, AnSt (in press).

<sup>3</sup> M. WAELKENS, *Sagalassos 1990–2004. A Balance of Fifteen Years of Urban Excavations and Research*, in: W. RADT (ed.), *Stadtgrabungen und Stadtforschung im westlichen Kleinasien. Geplantes und Erreichtes. Internationales Symposium 6./7. August 2004 in Bergama (Türkei)*, Byzas 3 (Istanbul 2006) 325–358.

<sup>4</sup> Arr. an. 1, 27,5–28

<sup>5</sup> S. MITCHELL, *The Hellenization of Pisidia*, *MedA* 4, 1991, 119–145 esp. 139. On Hellenistic Sagalassos, cf. M. WAELKENS, *Ein Blick von der Ferne. Seleukiden und Attaliden in Pisidien*, *IstMitt* 54, 2004, 435–471; M. WAELKENS – F. MARTENS – P. TALLOEN, *The Emergence and Development of Sagalassos as a ›polis‹ and a ›city‹*, in: H. ABASSOĞLU – F. KOLB (eds.), *Stadtentstehung und Stadtentwicklung in Kleinasien. Internationales Kolloquium in Istanbul, 15.–18. November 2001* (in press).

<sup>6</sup> WAELKENS 2002.

<sup>7</sup> M. WAELKENS et al., *Interdisciplinarity in Classical Archaeology. A Case Study: The Sagalassos Archaeological Research Project (Southwest Turkey)*, in: M. WAELKENS – J. POBLOME (eds.), *Report on the Survey and Excavation Campaign of 1994 and 1995, Sagalassos 4 = ActaALovMono 9* (Leuven 1997) 225–252 esp. 246 f.; J. POBLOME – M. ZELLE, *The Table Ware Boom. A Socio-Economic Perspective from Western Asia Minor*, in: C. BERNIS – H. VON HESBERG – L. VANDEPUT – M. WAELKENS (eds.), *Patris und Imperium. Kulturelle und politische Identität in den Städten der römischen Provinzen Kleinasien in der frühen Kaiserzeit*.

to be an important centre as a bishop's seat<sup>8</sup>. New public building initiatives in the 5<sup>th</sup> c. AD included a new city wall and several churches that gave the town a different, though still monumental appearance<sup>9</sup>. Several times during its history Sagalassos was struck by earthquakes. In the early 6<sup>th</sup> c. AD the town could still recover from a heavy earthquake<sup>10</sup>, but a similar revival was no longer possible after yet another earthquake in the late 6<sup>th</sup> c. AD<sup>11</sup>. Recent research suggests that after the 7<sup>th</sup> c. AD Sagalassos became the locus of a ›kastron‹, with possibly an occupancy on a smaller-scale in the central and southern part of the former town. So far, evidence has been retrieved for a (discontinuous?) occupancy for the period between the 8<sup>th</sup> and the early 13<sup>th</sup> c. AD<sup>12</sup>.

### Field Strategy of the Research on Urban Housing at Sagalassos

At Sagalassos various field strategies are being applied for the study of urban housing. Non-destructive research methods, being archaeological and geophysical surveys, offer a global insight into the spatial development of housing at the site<sup>13</sup>, while test soundings within the urban area, as well as the large-scale excavation of an urban mansion further refine this general picture and place it within a chronological framework.

As part of a doctoral research on the urban development of Sagalassos by F. Martens<sup>14</sup>, an intensive archaeological survey was applied at the site between 1999 and 2005<sup>15</sup>, while in 1998 a still ongoing programme of test soundings was initiated to find out more about the development of the town beyond its monumental centre<sup>16</sup>. Moreover, since 2002 additional spatial evidence has been generated through geophysical research, supervised by B. Mušić<sup>17</sup>. The overall picture thus obtained with respect to housing has further been exemplified and chronologically refined by the still ongoing excavations of a large elite housing complex that are carried out under the supervision of I. Uytterhoeven. This mansion is situated within the eastern residential area and bounds the north-south main street of the town to the east<sup>18</sup> (fig. 1). Although the main

Kolloquium Köln, November 1998, BaBesch Suppl. 8 (Leuven 2002) 275–287 esp. 276 f. On the development of Sagalassos during early and mid-Imperial times, cf. WAELEKENS 2002.

<sup>8</sup> On late antique Sagalassos, cf. WAELEKENS et al. 2006.

<sup>9</sup> JACOBS 2008.

<sup>10</sup> SINTUBIN et al. 2003.

<sup>11</sup> Recent osteoarchaeological analyses have suggested a date for this earthquake, which was formerly situated around the mid-7<sup>th</sup> c., between 540 and 620 AD, with the largest probability in the late 6<sup>th</sup> c., cf. B. DE CUPERE – S. THIJSS – W. VAN NEER – A. ERYNCK – M. CORREMANS – M. WAELEKENS, Eagle owl (*Bubo bubo*) Pellets from Roman Sagalassos (SW Turkey): Distinguishing the Prey Remains from Nest and Roost Sites, *International Journal of Osteoarchaeology* 19, 2008, 1–22.

<sup>12</sup> VIONIS – POBLOME – WAELEKENS in press.

<sup>13</sup> At other sites in Pisidia architectural/topographical surveys have offered an insight into the organisation and character of the residential areas as well, cf. e.g. for Kremna: MITCHELL et al. 1995, 158–175; for Melli: VANDEPUT – KÖSE 2001.

<sup>14</sup> MARTENS 2004; MARTENS accepted.

<sup>15</sup> During this period over two thirds of the total urban area enclosed within the necropolises were surveyed (ca. 11.5 ha were surveyed with a sampling strategy, another ca. 11 ha were covered with a full coverage technique). This survey involved the collection of all surface finds, except for building ceramics, and the mapping of all surface architecture. Currently the collected surface pottery is being restudied by the pottery team and N. Firat to obtain better insight into the distribution of less well represented chronological periods, as well as to explore the potential of a functional analysis of the collected pottery. On the results and methodological issues concerning this survey, cf. MARTENS 2004; MARTENS 2005; MARTENS et al. 2008; MARTENS accepted.

<sup>16</sup> Between 1998 and 2005 eleven trenches were excavated under the supervision of F. Martens on various main and secondary streets throughout the urban area. The 2007 test soundings mainly focused on the study of the water supply to the site. On the results of these test soundings with respect to the research on the street system of Sagalassos, cf. MARTENS 2007; MARTENS 2008a.

<sup>17</sup> So far, over 15 ha of the area where surface conditions created by vegetation and stone debris allowed geophysical research, have been surveyed using the magnetic method, whereas large parts of the same areas were also covered with closely spaced parallel GPR profiles for generating plan views of GPR echoes at arbitrarily selected depth sections (time slices) and 3D presentation, and interactive interpreting of distinct echoes.

<sup>18</sup> The excavations were initiated in 1995. For this mansion, cf. I. UYTTERHOEVEN – T. HELSEN – T. VEREENOGHE – M. WAELEKENS – J. POBLOME – R. DEGEEST, The 1998–99 Excavation Campaign at Sagalassos. The Domestic Area I Excavation, KST 22/2, 2000 (2001), 167–169; I. UYTTERHOEVEN, The 2000 Excavation and Restoration Season at Sagalassos. The Domestic Area DA 1, KST 23/1, 2001 (2002), 15 f.; I. UYTTERHOEVEN – T. PUTZEYS – M. WAELEKENS, Report on the 2002 Excavation and Restoration Campaign at Sagalassos 3. The Domestic Area, KST 25/1, 2003 (2004) 217 f.; I. UYTTERHOEVEN – M. WAELEKENS, Report on the

construction date of this mansion goes back to the 5<sup>th</sup> c. AD, it also incorporates parts of one or more early and mid-Imperial dwellings. The late antique elite house, whose owner must either have been a member of the urban elite – a member of the *proteuontes* or *honorati*, or perhaps even the bishop of the town – or a high-ranked official, continued to be inhabited – with various phases of transformation and ›ruralisation‹ – into the 7<sup>th</sup> c. AD.

In this paper we would like to give an overview of urban housing at Sagalassos by combining the different sources of evidence mentioned above and including the still largely unpublished data from the excavation of the aforementioned urban dwelling<sup>19</sup>.

#### Excursion: Methodology of the Geophysical Survey

The field methodology of the urban survey has been discussed in detail in other papers<sup>20</sup>. However, as important insights on the spatial organisation of the residential areas at large are derived from the geophysical survey that has not yet been published in full, the multi-method approach applied by the team of B. Mušič is explained in a more detailed way below.

In compliance with surface conditions and the accessibility of particular areas, the integrated geophysical approach has involved the application of the geo-electric resistivity method (Geoscan RM15), the magnetic method (Geoscan FM36 and Geometrics G-858) supported by measurements of the apparent magnetic susceptibility of soil samples and stone construction material (Kappameter KT-5), the Ground Penetrating Radar method using a 200 MHz antenna (GSSI SIR3000) and measurements of electric conductivity and magnetic susceptibility by electromagnetic induction (Geonics EM38).

Magnetic prospection has been applied with a total field magnetometer (Geometrics G-858) in order to measure changes in the vertical gradient of the total Earth's magnetic field density (Geometrics G-858) and with a Fluxgate gradiometer, which strictly measures the differences in the vertical component of the Earth's magnetic field. The magnetic method is a relatively fast and efficient technique to detect and map architectural remains providing results which are clear enough to allow a typological classification of archaeologically significant anomalies (fig. 2).

In the eastern residential area of Sagalassos magnetic anomalies generated by an induced magnetisation typical of stone built walls prevail, whereas in some areas, for instance in the Potter's Quarter, magnetic anomalies typical of features with a strong thermoremanent magnetisation (TRM), such as brick built structures (e.g. kilns), are much more frequent. Besides the standard magnetic data processing steps<sup>21</sup> and the archaeological implications resulting from these, some less frequently applied approaches have been used to amplify the ›signal-to-noise‹ ratio. For instance, the distinctive bipolarity of magnetic anomalies, which is characteristic for these latitudes, can be significantly reduced by applying the reduction-to-pole (RTP) transformation<sup>22</sup>, thus diminishing the displacement of magnetic anomalies with regard to the features causing these anomalies. The reduction-to-pole transformation significantly reduces the complexity in areas where several wall features are detected close to each other and even shows the actual position of objects with thermoremanent magnetisation (TRM), such as kilns, furnaces and forges (fig. 3). This is normally not to be expected for features comprising thermoremanent magnetisation (TRM) with an unknown orientation of the remanent magnetisation.

2003 Excavation and Restoration Campaign at Sagalassos. II. The Domestic Area Excavation, KST 26/1, 2004 (2005) 422–424, 432 f.; UYTTERHOEVEN – JACOBS – KIREMITÇI 2007; T. PUTZEYS – T. VAN THUYNE – J. POBLOME – I. UYTTERHOEVEN – M. WAELEKENS – R. DEGEEST, Analyzing Domestic Contexts at Sagalassos: Developing a Methodology Using Ceramics and Macro-Botanical Remains, JMedA 17/1, 2004, 31–57; UYTTERHOEVEN 2007; WAELEKENS et al. 2007; UYTTERHOEVEN – MARTENS 2008.

<sup>19</sup> An in-depth study on the methodology and results of the integrated research strategy, combining various non-destructive and minimally invasive techniques to investigate the planning and development of the eastern residential area of Sagalassos is currently under preparation (cf. MARTENS et al. in preparation).

<sup>20</sup> MARTENS 2005; MARTENS – VANHAVERBEKE – WAELEKENS 2008.

<sup>21</sup> A. TABBAGH – G. DESVIGNES – M. DABAS, Processing of Z<sup>0</sup> Gradiometer Magnetic Data Using Linear Transforms and Analytical Signal, Archaeological Prospection 4, 1997, 1–13; C. F. GAFFNEY – J. A. GATER – P. LINFORD – V. L. GAFFNEY – R. WHITE, Large-Scale Systematic Fluxgate Gradiometry at the Roman City of Wroxeter, Archaeological Prospection 7, 2000, 81–99.

<sup>22</sup> V. BARANOV, A New Method for Interpretation of Aeromagnetic Maps: Pseudo Gravimetric Anomalies, Geophysics 22, 1957, 359–383.

Ground Penetrating Radar (GPR) sounding has been used at Sagalassos to determine the depth and height of preservation of architectural elements, as well as their spatial relationship in the areas where magnetic results deemed it profitable to check. All areas represented in this paper were surveyed by a 200 MHz antenna (fig. 2: areas A, B and D; figs. 4–6). The best known approach for representing GPR results is the ›time slices method‹, which shows time slices of a series of parallel and usually equally spaced GPR profiles<sup>23</sup>. When put together, time slices compose a diagram of equal amplitudes of GPR echoes in the same time range of returning waves. In the archaeological application, this generates a series of ›plan views‹ at arbitrary depths (fig. 4).

At Sagalassos, a 3D-visualisation of the measured results has been applied for several areas, and many results have also been analysed in a 3D-environment, thus providing cross sections of the investigated soil volume in arbitrary directions, as well as a detailed insight into the spatial relationship of the architectural elements, their depths, widths and levels of preservation (fig. 5). This procedure is particularly suited for an interactive interpretation in a 3D-environment. Moreover, in an archaeological context it allows to discern various building phases<sup>24</sup>.

### Spatial and Chronological Development of the Western and Eastern Residential Quarters

#### Hellenistic Period

The earliest known phase of town planning at Sagalassos dates to Hellenistic times. From the 3<sup>rd</sup> c. BC onwards, the main civic buildings of the town were arranged in an irregular or at least asymmetrical manner around the Upper Agora. The late 3<sup>rd</sup> c. BC town wall enclosed an area of about 12.80 ha and, apart from the civic centre, also included the western residential area of Sagalassos, which is, consequently, believed to have been the original domestic area of the town<sup>25</sup>. This presumption seems to be supported by the survey evidence<sup>26</sup>. In the western part of the town surface remains of several houses built in ashlar architecture have been mapped during the architectural survey (fig. 7). Although these houses cannot be dated solely on the basis of the surface evidence, their original layout likely goes back to the Hellenistic period. With respect to the planning of this area, the northern half is relatively well-known, whereas the southern part is less accessible, due to a dense cover of prickly kermes oak (*Quercus coccifera*), which occurs both as low oak shrub and in tree form<sup>27</sup>. In the northern half of this area the wall structures show an almost perfect north-south/east-west orientation<sup>28</sup>, which was probably primarily dictated by the terrain conditions. As opposed to the area to the east of the monumental centre<sup>29</sup>, the rugged and sloping terrain of the western residential area was heavily terraced. In accordance to this topographical situation, the housing blocks seem to have been preferably built perpendicular to the contour lines and terraces. For instance, the buildings halfway up the slope followed the orientation of the terraces in this area and thus deviated from the orientation of the buildings higher up. Several houses as well as streets or alleys were cut into the rock<sup>30</sup> (fig. 8).

<sup>23</sup> E.g. D. GOODMAN – Y. NISHIMURA – J. D. ROGERS, GPRTime Slices in Archaeological Prospection, *Archaeological Prospection* 2, 1995, 85–89.

<sup>24</sup> B. MUŠIĆ – J. HORVAT, Nauportus – an Early Roman Trading Post at Dolge njive in Vrhnika. The Results of Geophysical Prospecting Using a Variety of Independent Methods, *Arheološki vestnik* 58, 2007, 219–283.

<sup>25</sup> MARTENS accepted.

<sup>26</sup> A recent re-study of pottery collected in the western residential area, also including the non-diagnostic pottery, allowed to identify low densities of (late) Hellenistic pottery scattered all over the western residential area.

<sup>27</sup> Due to these terrain conditions and the presence of vegetation and stone debris, the results of the geophysical survey are generally better for the eastern residential area than for this western residential zone. GPR-profiles were analysed for the lower terraces of the western residential area during the 2007 campaign, whereas in 2008 GPR and magnetometry were applied in the areas where vegetation could be removed, which also allowed to map the surface architecture. This field work generally offered good results, although the relatively limited dimensions of the zones that could be surveyed has continuously implied that so far no complete ground plans of domestic units could be reconstructed.

<sup>28</sup> From west to east: –89°, 88°, 82° and –86° in the east-west direction and 0° and –1° on the north-south-axis.

<sup>29</sup> Cf. below.

<sup>30</sup> MARTENS 2004, 263–265; MARTENS accepted. The same situation can also be seen at other sites which were laid out on similar terrain conditions. For examples of partly rock-cut houses at the Pisidian town at Melli, cf. VANDEPUT – KÖSE 2001, 138 fig. 9;

In the eastern residential area, which lay outside of the Hellenistic fortified circuit to the east of the monumental centre, a late Hellenistic Fountain House<sup>31</sup> and a polygonal wall<sup>32</sup> in the northern part of this area so far form the only evidence for occupation here during Hellenistic times. Although it cannot be excluded that this area was already used for housing purposes during this period, the available evidence mainly testifies to a large scale building operation from the late Hellenistic and certainly from the Augustan period onwards.

### Imperial Period

Between the early 1<sup>st</sup> c. BC and the later 2<sup>nd</sup> c. AD the town centre of Sagalassos received a new plan, which was realised in several phases<sup>33</sup>. From the early Imperial period onwards the urban area expanded to the south and the east, beyond the boundaries of the Hellenistic town wall, which thus fell into disuse. The town now reached its maximal extent of ca. 31.5 ha, an area which was enclosed by the city's necropoleis<sup>34</sup>. To the east of the monumental centre a new residential quarter was laid out, which, as mentioned above, may already have been planned before the reign of Augustus (fig. 9). The excellent results of the magnetometer survey in this area have demonstrated that the overall planning of this domestic zone housed a number of *insulae* with divergent orientations, which generally did not comply with the planning of the Upper or Lower town of the site (fig. 2). Further analyses of the results of the various geophysical survey techniques applied here, combined with the evidence from test soundings in the area, should clarify to which extent topographical imperatives or chronological aspects are responsible for this picture<sup>35</sup>.

Test soundings, the excavation of the Library Fountain complex in the northern and that of the urban mansion in the central part of the eastern domestic area have provided evidence for at least two buildings phases<sup>36</sup>. More particularly, there are indications for building activities in the early Imperial period and during the late 2<sup>nd</sup> to 3<sup>rd</sup> c. AD. The evidence of trench TSW2 revealing a large building of Augustan date and the adjoining early 1<sup>st</sup> c. AD cobbled street exposed in trench TSW1 have confirmed the early layout of this northern half of the residential zone<sup>37</sup>. In addition, in the central part of this living quarter, some parts of the 5<sup>th</sup> c. elite dwelling are proven to go back to the 1<sup>st</sup> c. AD and thus attest that the late antique mansion was preceded by an early Imperial building. Particularly, the paved courtyard of the mansion (Courtyard XIII) originally belonged to an early 1<sup>st</sup> c. AD *peristylum* house<sup>38</sup> (fig. 10). After having been incorporated

at Latmos, cf. A. PESCHLOW, *Latmos und Herakleia. Stadtplan, Wohnviertel und Häuser einer gewachsenen und einer geplanten Stadt*, in: *Bauplanung und Bauphysik der Antike*, DiskAB 3 (Berlin 1978) 102–104 figs. 1. 2.

<sup>31</sup> On this fountain house, cf. M. WAEKENS – E. PAULISSEN – B. ARIKAN – I. VAN DAMME – I. AKYEL – F. LANDUYT – M. MARTENS – H. SIMILLION – T. HELSEN – J. VAN DEN BERGH – E. KOSMETATOU – V. VANDER GINST – V. ROTS – E. HARTOCH – S. BUBEL – F. MARTENS – I. UYTTERHOEVEN – L. LOOTS – T. DEBRUYNE – E. MEYLEMANS – A. SCHUERMANS – B. VANDAELE – P. TALLOEN – Z. PARRAS – C. LICOPPE – J. POBLOME – R. DEGEEST – L. MOENS – P. DE PAEPE – T.C. PATRICIO – S. ERCAN – K. VAN BALEN – F. DEPUYDT, *The 1996 and 1997 Excavation Seasons at Sagalassos*, in: WAEKENS – LOOTS 2000, 217–398 esp. 312–329 with further references.

<sup>32</sup> It concerns a well preserved polygonal wall immediately north of the Neon Library; cf. M. WAEKENS – E. PAULISSEN – E. OWENS – B. ARIKAN – L. GJUSEN – M. MARTENS – V. MATAOUCHEK – K. VANDAELE, *The 1993 Excavations in the Fountain House-Library Area*, in: M. WAEKENS – J. POBLOME (eds.), *Report on the Fourth Excavation Campaign of 1993, Sagalassos 3 = ActaALovMono 7* (Leuven 1995) 47–89 esp. 54 figs. 23. 24. 31.

<sup>33</sup> In the 1<sup>st</sup> c. AD a re-arrangement of the area around the Upper Agora was followed by the layout of a second urban core centered on the Lower Agora. Buildings and infrastructure were as much as possible laid out according to a regular system with a north-south orientation, but in compliance with the topographical imperatives. As a result, the Upper and Lower town had diverging orientations (Upper town: north-south direction: -18°/-19°; west-east direction: ca. 72°/73°; Lower Town: north-south direction: ca. -4°; east-west direction: ca. 84°/88°). Cf. MARTENS 2004, 615–625; MARTENS 2008a; MARTENS accepted.

<sup>34</sup> Cf. MARTENS 2004; MARTENS 2005; MARTENS accepted.

<sup>35</sup> There is a well-organized central part with a north-south orientation of -10° and west-east orientations between 80° and 86°. More to the east there are *insulae* with divergent northeast-southwest orientations of -2°, 16°, 25° and 27°. Further south the orientations change once more (MARTENS 2004, 200–210. 458). The interpretation of this part of the urban plan will be discussed in a separate paper, cf. MARTENS et al. in preparation.

<sup>36</sup> MARTENS 2007, 329–332.

<sup>37</sup> Trench TSW2 revealed part of a west facing wall constructed in irregular pseudo-isodomic ashlar masonry with unordered courses of different heights, and showed that only a few decennia after the initial construction of the building, the surrounding area seems to have been filled up again in order to create a new level with an additional height of at least 1.50 m, cf. MARTENS 2007, 333. 336.

<sup>38</sup> A test sounding carried out below the courtyard dated its paving to the early 1<sup>st</sup> c. AD, particularly during the reign of Emperor Tiberius or Nero (pottery dating by J. Poblome).

into later private constructions, this court continued to function as the heart of the ›private‹ part of the late antique mansion<sup>39</sup>.

Later on, the eastern domestic area was further transformed by another large-scale building programme of urban infrastructure that seems to have taken place during the 2<sup>nd</sup> and 3<sup>rd</sup> c. AD. This intervention has been demonstrated by excavations in the northern half of the residential quarter, which suggest that the esplanade between the Library and the Doric Fountain House, as well as the street giving access to the theatre were both (re-)arranged during the later 2<sup>nd</sup> to early 3<sup>rd</sup> c. AD. In the course of the 3<sup>rd</sup> c. the east-west-street connecting the Upper Town and the Library-Fountain complex with the eastern periphery of the town seems to have been re-arranged or paved as well<sup>40</sup>.

In addition, the quarter of the large urban mansion in the south was also apparently re-organised in the 2<sup>nd</sup> c. AD. In this period a north-south street covering a main sewer was constructed here. In later times this street would be integrated into the western service quarter of the late antique mansion (Rooms VII and VIII). In correspondence with this street, some walls with north-south orientation were built in the north of the current excavation area, either as part of a new dwelling or as a northern extension of the 1<sup>st</sup> c. AD *peristylum* house which clearly underwent several adaptations and extensions during the 2<sup>nd</sup> and 3<sup>rd</sup> c. AD<sup>41</sup>. These walls were later overbuilt by the late antique mansion, in particular by its northern, representative wing (esp. south wall of Room XXXVII).

The analysis of the orientations of the various components of the late antique mansion suggests that the building was located at a key point of the two main orientation systems of the town. Whereas the architectural remains dating to the 1<sup>st</sup> c. AD (Courtyard XIII) had followed the orientation of the Upper Town, the 2<sup>nd</sup> c. street and the associated new walls under the south wall of Room XXXVII were oriented now according to the prevailing orientation of the Lower Town. However, when the 1<sup>st</sup> c. *peristylum* house was extended and repaired in the 2<sup>nd</sup> and 3<sup>rd</sup> c. AD the new walls (e.g. Courtyard XXV) respected the ›original‹ orientation, i.e. that of the Upper Town (fig. 11).

For the inhabitation of the western residential area during Imperial times one has to rely mainly on surface evidence, which is somewhat problematic for this period. Due to the chronological superposition of surface evidence at the site, caused by the fact that Sagalassos was apparently not intensively inhabited nor cultivated after the end of the large-scale occupancy, the evidence of the pre-, early and mid-Imperial occupancy is generally underrepresented in the surface collection in favour of the ›over-represented‹ final phases of the large-scale inhabitation of the site, particularly the period 450/75–550/75AD<sup>42</sup>. This situation is only reversed at those locations where surface processes or post-depositional disturbance have opened ›chronological windows‹ upon the earlier phases<sup>43</sup>. Apart from the architectural evidence of some Early to Middle Imperial buildings with a public/representative character within or adjoining the western domestic area, two locations with high densities of early to mid-Imperial pottery have been recorded during the survey, in relation to dwellings located on erosive slopes within the northern and central part of the western residential quarter<sup>44</sup>. This evidence suggests that the Hellenistic western domestic area also continued to be occupied during the early and mid-Imperial periods.

<sup>39</sup> UYTTERHOEVEN 2007; UYTTERHOEVEN – MARTENS 2008.

<sup>40</sup> MARTENS 2007, 332 with references.

<sup>41</sup> E.g., Courtyard XXV and its surrounding arcades were rebuilt several times, whereas a service quarter was created on a higher level (Rooms XXIII, XXIV, XXVI).

<sup>42</sup> Phase 8 of the relative typological sequence of Sagalassos Red Slip Ware, cf. POBLOME 1999.

<sup>43</sup> MARTENS 2005, 239 f.; MARTENS et al. 2008, 133.

<sup>44</sup> These ›chronological windows‹ were attested to the far west of the sanctuary of Apollo Klarios. A first one was situated within a partly rock-cut building. This complex possessed several regular subdivisions, an ashlar built exterior west wall, a rock-cut room and a room with substructures, apparently in *opus caementicium*, which originally must have supported a roof or vault. The building may have been a rich dwelling (based on the related finds of polychrome tesserae) or may have had a (semi-)public character. Pottery evidence has suggested an occupancy of the complex from the 1<sup>st</sup> until the late 3<sup>rd</sup> c. AD and during Late Antiquity (MARTENS 2004, 230, 235 f.). Further west a second ›chronological window‹ testified to the same early to mid-Imperial occupation through exceptionally high pottery densities found in relation to a east-west wall of mortared rubble, which could be traced for at least 12 m and may have belonged to a rich dwelling considering the related finds with a high density of vessels, window glass and tesserae (MARTENS 2004, 257).

By the mid-Imperial period, the boundaries and functional organisation of the urban area were clearly fixed. Within the expanded urban area of ca. 31.5 ha, about 23.5 ha may have been available for habitation and other urban functions. The urban population may have counted 2350 to 3525 inhabitants in this period<sup>45</sup>.

### Late Antiquity

The urban area of Sagalassos likely maintained its overall extent of at least 31.5 ha until the mid-6<sup>th</sup> c. AD. The construction of a new fortification wall during the transition of the 4<sup>th</sup> to the 5<sup>th</sup> c. had no long-term influence on the occupation outside the fortified circuit<sup>46</sup>. The new wall largely followed the course of its Hellenistic predecessor<sup>47</sup> and thus incorporated only part of the by now extended urban area. In spite of this, results from both the survey and the excavation suggest that habitation outside this fortified area continued into the 6<sup>th</sup> c. AD, as it had done before<sup>48</sup>.

The evidence of the urban mansion clearly shows that members of the late antique elite continued to build their dwellings on the slopes of the eastern domestic area, even though these zones were now situated outside of the city wall. In the late 4<sup>th</sup> – early 5<sup>th</sup> c. AD the dwelling had its largest extension and became a mansion with ›palatial‹ features<sup>49</sup> (figs. 1 and 6). The 1<sup>st</sup> to 3<sup>rd</sup> c. AD courtyard area (Courtyards XIII and XXV) was incorporated into an extended private complex with at least 71 spaces arranged on seven terraces<sup>50</sup>. It comprised a large representative wing enclosing several richly decorated reception/audience and dining halls, a bathing complex<sup>51</sup>, private dining/reception rooms and service quarters<sup>52</sup>. Interestingly, the orientation of the newly arranged parts of the late antique mansion more or less complied with the 1<sup>st</sup> c. grid, which followed the orientation of the Upper Town (fig. 11). In addition, the layout of the rooms on the – so far – highest terrace of the building possibly suggest that yet other orientations within the urban plan met at this place, maybe governed by the topographical situation<sup>53</sup>.

After 500 AD, when Sagalassos was struck by a severe earthquake, the damage to both public and private buildings was still repaired with a sense of monumentality. However, the period between the mid 5<sup>th</sup> and mid-6<sup>th</sup> c. AD testifies to a gradually changing use of urban space, with for instance the encroachment of public structures and the subdivision of the urban mansion<sup>54</sup>. Large scale excavations and test soundings have shown that two apparently contradictory processes affected the street system of Sagalassos during the

<sup>45</sup> This estimate was derived by multiplying the area of 23.5 ha, for which the archaeological survey at Sagalassos suggested a residential function, with the population density figure of 100 to 150 persons per ha proposed by J. Russell for a medium sized town. Cf. J. C. RUSSELL, *Late Ancient and Medieval Population*, *TransactAmPhilosSoc* 48/3 (Philadelphia 1958) 68.

<sup>46</sup> Survey evidence seems to suggest a temporal shift of activity (habitation?) into the direction of the late fortification wall around its time of construction, which may perhaps be connected to the military insecurity of this period, cf. MARTENS et al. 2008, 138.

<sup>47</sup> L. LOOTS – M. WAELEKENS – F. DEPUYDT, *The City Fortifications of Sagalassos from the Hellenistic to the Late Roman Period*, in: M. WAELEKENS – L. LOOTS (eds.), *Report on the Survey and Excavation Campaigns of 1996 and 1997, Sagalassos 5* = *ActaALovMono* 11 (Leuven 2000) 595–634 esp. 614–616; JACOBS 2008.

<sup>48</sup> This general picture of continuous habitation, however, does not exclude that minor shifts in the occupation pattern took place or that certain parts of urban quarters temporarily may have fallen into disuse or may have been under repair during a certain period. Evidence from survey and test soundings suggests that this was, for instance, the case for the northwest part of the eastern residential area, to the east of the Library which was looted and destroyed during the late 4<sup>th</sup> c. Cf. MARTENS 2005, 249; MARTENS 2007, 352 f.; MARTENS et al. 2008, 138.

<sup>49</sup> For the relation between late antique palace architecture and the architecture of private houses, cf. N. DUVAL, *Comment reconnaître un palais impérial ou royal? Ravenna et Piazza Armerina*, *FelRav* 108, 1978, 29–60; N. DUVAL, *Les maisons d'Apamée et l'architecture ›palatiale‹ de l'antiquité tardive*, in: BALTY – BALTY 1984, 447–470; N. DUVAL, *Existe-t-il une ›structure palatiale‹ propre à l'antiquité tardive?*, in: E. LÉVY (ed.) *Le système palatial en Orient, Grèce et à Rome. Actes du Colloque, Strasbourg, 19–22 juin 1985* (Leiden 1987) 463–490; D. SCAGLIARINI CORLAITA, *Domus–villae–palatia. Convergenze e divergenze nelle tipologie architettoniche*, in: J. ORTALLI – M. HEINZELMANN (eds.), *Abitare in città. La Cisalpina tra impero e medioevo. Leben in der Stadt: Oberitalien zwischen römischer Kaiserzeit und Mittelalter*, *Kolloquium, Rom*, 4.–5. November 1999, *Palilia* 12 (Wiesbaden 2003) 153–172.

<sup>50</sup> The mansion must have stretched over a minimum area of 55 m by 55 m. Each terrace had at least one upper floor.

<sup>51</sup> UYTTERHOEVEN – MARTENS 2008.

<sup>52</sup> This rebuilding programme implied that the 2<sup>nd</sup> c. street to the west of the house was ›encroached‹ by the extended mansion (esp. Rooms VII and VIII), whereas the 2<sup>nd</sup> c. walls in the north part of the house were also overbuilt (Room XXXVII) (cf. *supra*).

<sup>53</sup> Especially the triangular Room LIV may have functioned as the contact point between two grid systems.

<sup>54</sup> On the changing physical appearance of the late antique town, cf. WAELEKENS et al. 2006, 227–235.

period of 450/75 AD to 550/75 AD, whereby some streets were narrowed, but became more monumental in appearance, whereas other streets were stripped of their paving slabs, leaving their stone substratum exposed<sup>55</sup>. At the same time the urban water management system underwent important changes as well, which consequently must have affected the supply to private customers<sup>56</sup>. From the 2<sup>nd</sup> half of the 6<sup>th</sup> c. AD onwards the town was clearly in decline<sup>57</sup>. Several public areas were now transformed into dumping places or became ›ruralised‹<sup>58</sup>. This phenomenon also took place in private contexts, as is for instance illustrated by Courtyard XXV of the urban mansion. Formerly a richly decorated private space, this courtyard was turned into a cattle stable with animal troughs (gallery XXXIII). Similarly, the large luxurious audience hall XLVI now became a storage room for *dolia*<sup>59</sup>.

As mentioned above, at the end of the 6<sup>th</sup> c. Sagalassos was struck by a devastating earthquake, which formed the onset to the end of the dense occupation of the site<sup>60</sup>. The extreme scarceness of phase 9 (550/75-640/50 AD) pottery<sup>61</sup> in the survey evidence may suggest a less dense and significantly less extensive occupation of the urban area between the later 6<sup>th</sup> and the mid-7<sup>th</sup> c. AD. However, as this pottery was not spread over the surface by later occupation and thus only appears in isolated spots, it is not possible to draw definitive conclusions on the extent of the 7<sup>th</sup> c. AD occupancy of Sagalassos on the basis of the current surface collection<sup>62</sup>. On the other hand, it is also worth mentioning that the test soundings, six of which were carried out in the eastern residential area, have so far not yielded substantial evidence on a 7<sup>th</sup> c. AD occupation. In contrast, the presence of Phase 9 pottery in relation to a new occupation level, including hearths and tile floors, which were set up on top of the earthquake destruction material in several rooms of the late antique mansion, has proven that – at least – part of this area continued to be occupied into the (early) 7<sup>th</sup> c. AD.

In addition, a water supply system built on top of the debris of the final earthquake, conducting water from the upper parts of the site towards the former lower town seems to support the presence of some kind of communal organisation in this late period<sup>63</sup>. As mentioned above, after the large-scale occupancy of the site came to an end, smaller-scale communities seem to have inhabited parts of the former town into the mid-Byzantine period<sup>64</sup>.

<sup>55</sup> On the evolution of the street system of Sagalassos in late Antiquity cf. MARTENS 2007. On the changes in the urban water management, cf. F. MARTENS, Water Abundance and Shortage at Sagalassos and Pisidia (SW-Turkey), in: OHLIG 2008, 247–262.

<sup>56</sup> UYTTERHOEVEN – MARTENS 2008.

<sup>57</sup> On the combination of factors causing the decay of the Classical city, cf. H. VANHAVERBEKE – F. MARTENS – M. WAELEKENS – J. POBLOME, Late Antiquity in the Territory of Sagalassos (Pisidia, SW Turkey), in: W. BOWDEN – L. LAVAN – C. MACHADO (eds.), Recent Research on the Late Antique Countryside, LAA 2 (Leiden – Boston 2004) 247–279; H. VANHAVERBEKE – F. MARTENS – M. WAELEKENS, Another View on Late Antiquity: Sagalassos (SW Anatolia), its Suburbium and its Countryside in Late Antiquity, in: A. G. POULTER (ed.), The Transition to Late Antiquity. On the Danube and Beyond, Proceedings of the British Academy 141 (Oxford – New York 2007) 611–648.

<sup>58</sup> WAELEKENS et al. 2006, 233–235.

<sup>59</sup> UYTTERHOEVEN – JACOBS – KIREMITÇI 2007; WAELEKENS et al. 2007.

<sup>60</sup> On the impact of this earthquake cf. M. WAELEKENS – M. SINTUBIN – P. MUCHEZ – E. PAULISSEN, Archaeological, Geomorphological and Geological Evidence for a Major Earthquake at Sagalassos (SW Turkey) around the Middle of the Seventh Century AD, in: W. G. MACGUIRE – D. R. GRIFFITHS – P. L. HANCOCK – I. S. STEWART (eds.), The Archaeology of Geological Catastrophes (London 2000) 373–383; SINTUBIN et al. 2003.

<sup>61</sup> Phase 9, cf. POBLOME 1999.

<sup>62</sup> MARTENS 2005, 249.

<sup>63</sup> A rubble-built water supply channel (interior dimensions: 13–16 × 9–15 cm) with a stepped floor of tiles descended from the Upper Town across the west portico of the Macellum and the former east portico of the Lower Agora, cf. MARTENS 2006, 169, fig. 2. Another water channel arranged upon the western edge of Room IX of the urban mansion under excavation may have belonged to the same supply system.

<sup>64</sup> Excavations have provided evidence for small-scale occupation during the 8<sup>th</sup>/9<sup>th</sup> and 11<sup>th</sup>–13<sup>th</sup> c. AD at the former Sanctuary of Apollo Klarios; between the 6<sup>th</sup> and mid-13<sup>th</sup> c. AD further to the south at the former sanctuary of Hadrian and Antoninus Pius, and between the 6<sup>th</sup> and the 1<sup>st</sup> half of the 13<sup>th</sup> c. AD at Alexander's Hill to the far south of the ancient town. On the ceramological evidence cf. VIONIS – POBLOME – WAELEKENS in press.



## Functional Organisation of the Residential Areas and Housing Typology at Sagalassos

Apart from giving an idea of the general urbanistic development of Sagalassos, the archaeological survey has – in combination with the results of the geophysical survey – also offered insight into the functional zoning of the town. As already mentioned above, the residential areas, which could be identified to the east and west of the monumental centre, reached a maximal extent of 23.5 ha in Imperial times.

Survey evidence from the western residential zone has clearly shown how this area incorporated various functions. The northern half of the area was traversed by an east-west oriented main street leading from the western periphery of the site to the monumental centre. Along this street and in particular toward the western access point to the city centre, there is architectural evidence for a number of monumental structures, including a shrine dating to the second half of the 1<sup>st</sup> c. AD and some honorific monuments<sup>65</sup>. In the late antique period typical ›district churches‹ were built in this western residential quarter<sup>66</sup>. In addition, it can be expected that commercial installations were also arranged along this important traffic artery<sup>67</sup>. Yet, although artisanal/commercial activity is often found in association with a residential function in ancient towns<sup>68</sup>, the quantities of production waste collected within the western residential area are clearly less important than the quantities of metal slag found just to the south of the walled zone<sup>69</sup>. The functional interpretation of these concentrations within and outside of the walls, which either represent craft activity or derive from terracing activities<sup>70</sup>, has been checked by tracing metal pollution in the soil surrounding these concentrations. These analyses have clearly shown that when the production was of a substantial scale, the activity was marginalised from the urban area and was concentrated in what appeared as industrial quarters<sup>71</sup>. Apart from this, the survey of the western domestic area has obviously also yielded evidence for housing, especially in the southeastern part

<sup>65</sup> The blocks of this building, which according to the building inscription was constructed by local benefactors in honour of the Emperors Claudius and Nero, were later reused in a 5<sup>th</sup> or 6<sup>th</sup> c. AD Christian basilica, cf. MARTENS 2004, 251–255; MARTENS 2005, 243.

<sup>66</sup> About 70 m to the south of the Imperial shrine that was transformed into a church, architectural evidence has been found for another Christian basilica, cf. MARTENS 2004, 250 f. Such ›district churches‹ incorporated as parish churches in dwelling areas are typical of the early Christian period and can also be recognized at other sites, cf. P. TALLOEN, *Cult in Pisidia. Religious Practice in Southwestern Asia Minor from the Hellenistic to the Early Byzantine Period I–II* (Ph.D. diss. Katholieke Universiteit Leuven 2003) 75 with references. E.g. for Ephesos: P. SCHERRER, *The City of Ephesos. From the Roman Period to Late Antiquity*, in: H. KOESTER (ed.), *Ephesos. Metropolis of Asia. An Interdisciplinary Approach to its Archaeology, Religion and Culture*, *HarvTheolStud* 41 (Valley Forge 1995) 1–25 esp. 23; for nearby Kremna: MITCHELL et al. 1995, 158–171 figs. 4. 42–45.

<sup>67</sup> Cf. e.g. for Pompeii: LA TORRE 1988.

<sup>68</sup> E. J. OWENS, *Residential Districts*, in: I. M. BARTON (ed.), *Roman Domestic Buildings*, *Exeter Studies in History* (Exeter 1996) 7–32 esp. 16–18; LA TORRE 1988; B. GRAFELS, *Metallverarbeitende Produktionsstätten in Pompeji*, *BARInterSer* 433 (Oxford 1988).

<sup>69</sup> Mainly in the western residential area various types of metal slag were found (cf. KELLENS et al. 2003). The survey evidence, however, does not allow to localise secondary glass production either within the walled area or rather in the industrial quarters outside of the residential quarters. On glass working at Sagalassos, cf. P. DEGRYSE – J. SCHNEIDER – J. POBLOME – M. WAELEKENS – U. HAACK – P. MUCHEZ, *A Geochemical Study of Roman to Early Byzantine Glass from Sagalassos, South-west Turkey*, *JASc* 32, 2005, 287–299; P. DEGRYSE – J. SCHNEIDER – U. HAACK – V. LAUWERS – J. POBLOME – M. WAELEKENS – Ph. MUCHEZ, *Evidence for Glass ›Recycling‹ Using Pb and Sr isotopic Ratios and Sr-Mixing Lines: The Case of Early Byzantine Sagalassos*, *JASc* 33, 2006, 494–501.

<sup>70</sup> Metal slags from which all valuable metal was extracted, were frequently reused for construction works or for example for metalling roads in ancient times, cf. D. SIM, *Beyond the Bloom*, *BARIntSer* 725 (Oxford 1998) 2; M. MONTEIL – S. BARBERAN – V. BEL – M.-L. HERVÉ, *Dépotoirs domestiques et déchets artisanaux: l'exemple de Nîmes (Gard) au Haut-Empire*, in: BALLEST et al. 2003, 121–131 esp. 128.

<sup>71</sup> These chemical analyses testing the metal pollution at areas where the survey spotted concentrations of metal slag were carried out by P. Degryse and will be included in a forthcoming Ph.D by N. Kellens on metal production at Sagalassos (N. KELLENS, *The Metal instrumentarium domesticum from Sagalassos, SW Turkey. Function, Chronology, Context and Technology* [Ph.D. diss. Katholieke Universiteit Leuven in preparation]). On metal working at the site cf. KELLENS et al. 2003, P. DEGRYSE – P. MUCHEZ – J. NAUD – M. WAELEKENS, *Iron production at the Roman to Byzantine City of Sagalassos: An Archaeometrical Case Study*, in: *Archaeometallurgy in Europe* 2003, 133–142; P. DEGRYSE – J. SCHNEIDER – N. KELLENS – M. WAELEKENS – Ph. MUCHEZ, *Tracing the Resources of Iron Working at Ancient Sagalassos (South-West Turkey): A Combined Lead and Strontium Isotope Study on Iron Artefacts and Ores*, *Archaeometry* 49, 2007, 75–86. Industrial areas at Sagalassos were located in the sepulchral/industrial areas southwest of the town wall and in the eastern extremity of the town, at the Potters' Quarter (cf. MARTENS 2004, 314–319; MARTENS 2005, 243 f.).

of the area, where column fragments at the surface suggest the presence of high status houses<sup>72</sup>. Although no ground plans could be reconstructed so far, a comparison with evidence from other sites shows that dwellings provided with a court entirely or partly surrounded by porticoes were the most common house type in the Hellenistic and Roman periods. As is well known at sites such as Priene and Pergamon<sup>73</sup>, the central court of the Hellenistic *prostas* house had porticoes only at its eastern, southern and western sides, while at its northern side, facing the entrance, a *megaron* consisting of a main room (*oecus*) and a fore hall with two columns *in antis* was located. On the other hand, Hellenistic houses with a real *peristylum* functioning as status symbol<sup>74</sup>, as those developed for instance at Pergamon, Ephesos and Priene<sup>75</sup>, were centred on a courtyard with porticoes at four sides. These dwellings were typically provided with an *andron* opening onto the *peristylum*, while they could additionally have other facilities, such as guestrooms, a kitchen, a *latrina* and/or bathing facilities<sup>76</sup>. Hellenistic *peristylum* houses often stayed in use during several generations with only some smaller alternations<sup>77</sup>. Moreover, in the eastern provinces the *peristylum*, as a fixed component, would remain the ›standard‹ element throughout the Imperial period into the 6<sup>th</sup> c. AD, as is attested at several Anatolian sites including Ephesos, Hierapolis, Pergamon and Xanthos<sup>78</sup>, but is for instance also clear in the large urban mansion in the eastern part of Sagalassos. In addition, tuff column fragments found on the surface in the central part of the Western residential quarter suggest the presence of (a) late antique house(s) with a peristyle court here, since similar tuff columns were used for late 4<sup>th</sup>–early 5<sup>th</sup> c. AD interventions in the urban mansion in the eastern domestic area.

Thus, in regard to the situation at Sagalassos, housing types similar to those known from other Anatolian sites may be expected, although further research through geophysics and test soundings, offering stratified

<sup>72</sup> When comparing the possible furnishing and status of these dwellings, it is remarkable that in comparison with the northern half (survey 2001) only a limited amount of glass finds (and almost no window glass) were found within the southern part of the western residential area (survey 2003). Isolated fragments of marble wall veneer found among the architectural remains of the houses, however, may point to a higher status.

<sup>73</sup> For Priene: RUMSCHEID 1998; for Pergamon: WULF 1999.

<sup>74</sup> Cf. WURMSER in this volume.

<sup>75</sup> W. HOEFNER – G. BRANDS (eds.), Basileia. Die Paläste der hellenistischen Könige. Internationales Symposium, Berlin, 16.–20. 12. 1992 (Mainz 1996); I. NIELSEN, Hellenistic Palaces: Tradition and Renewal, Studies in Hellenistic Civilization 5 (Aarhus 1999). For Pergamon: D. PINKWART – W. STAMNITZ, Peristylhäuser westlich der unteren Agora, AvP 14 (Berlin 1984); W. RADT – E. STEINER, Pergamon. Geschichte und Bauten einer antiken Metropole (Darmstadt 1999); WULF 1999. For Ephesos: LANG-AUINGER 1996. For Priene: TH. WIEGAND – H. SCHRADER, Priene. Ergebnisse der Ausgrabungen und Untersuchungen in den Jahren 1895–1898 (Berlin 1904); M. SCHEDE – G. KLEINER – W. KLEISS, Die Ruinen von Priene (Berlin 1964); RUMSCHEID 1998; W. RAECK, Priene. Neue Forschungen an einem alten Grabungsort, IstMitt 53, 2003, 313–423. Traditionally, House XXXIII from Priene is considered a nice example for the transition from a *prostas* (2<sup>nd</sup> c. BC phase) to a *peristylum* house (1<sup>st</sup> c. AD phase), cf. E. BRÖDNER, Wohnen in der Antike (Darmstadt 1989) 49 f.

<sup>76</sup> Cf. RUMSCHEID in this volume.

<sup>77</sup> As was for instance the case with Bau Z at Pergamon between the 2<sup>nd</sup> c. BC and the 2<sup>nd</sup> c. AD; cf. M. BACHMANN, Bau Z in Pergamon, in: H. BANKEL (ed.), Bericht über die 42. Tagung für Ausgrabungswissenschaft und Bauforschung vom 8. bis 12. Mai 2002 in München (Bonn 2004) 214–225.

<sup>78</sup> Cf. P. GROS, L'architecture romaine: du début du III<sup>e</sup> siècle av. J.–C. à la fin du Haut-Empire 2. Maisons, palais, villas et tombeaux, Les manuels d'art et d'archéologie antiques (Paris 2001) 214–230 (with examples). For Ephesos: LANG-AUINGER 1996; F. KRINZINGER (ed.), Das Hanghaus 2 von Ephesos. Studien zu Baugeschichte und Chronologie, AForsch 7 = DenkschrWien 302 (Vienna 2002); I. ADENSTEDT, Die Wohneinheiten 3 und 5 im Hanghaus 2 in Ephesos – eine erste Rekonstruktion, in: B. BRANDT – V. GASSNER – S. LADSTÄTTER (eds.), Synergia. Festschrift für Friedrich Krinzinger I (Vienna 2005) 31–37; H. THÜR, Das Hanghaus 2 in Ephesos. Die Wohneinheit 4. Baubefund, Ausstattung, Funde, FiE 8, 6 (Vienna 2005). For Hierapolis: A. ZACCARIA, Missione archeologica italiana a Hierapolis di Frigia (Turchia): lo scavo della Casa dei capitelli ionici, Le missioni archeologiche dell'Università Ca'Foscari di Venezia (Venice 2000) 29–33; A. ZACCARIA, Campagne di scavo nella Casa dei capitelli ionici a Hierapolis di Frigia (Turchia): missione archeologica italiana, Le missioni archeologiche dell'Università Ca'Foscari di Venezia (Venice 2002) 29–36; A. ZACCARIA RUGGIU, Regio VIII, insula 104. Le strutture abitative: fasi e trasformazioni, in: F. D'ANDRIA – M. P. CAGGIA (eds.), Le attività delle campagne di scavo e restauro 2000–2003, Hierapolis di Frigia 1 (Istanbul 2007) 211–256. For Pergamon: PINKWART – STAMNITZ 1984; WULF 1999. For Xanthos: J. DES COURTILS – L. CAVALIER, The City of Xanthos from Archaic to Byzantine Times, in: D. PARRISH (ed.) Urbanism in Western Asia Minor. New Studies on Aphrodisias, Ephesos, Hierapolis, Pergamon, Perge and Xanthos, JRA Suppl. 45 (Ann Arbor 2001) 148–171; A.-M. MANIÈRE-LEVÊQUE, La maison de l'acropole lycienne à Xanthos, Anatolia Antiqua 10, 2002, 235–244. For the *peristylum* house in late Antiquity, cf. S. P. ELLIS, The End of the Roman House, AJA 92, 1991, 565–576; S. P. ELLIS, Early Byzantine housing, in: K. DARK (ed.), Secular Buildings and the Archaeology of Everyday Life in the Byzantine Empire (Oxford 2004) 38–43.

evidence, would be required to make statements on the date range, typology and status of the domestic architecture of the western residential area.

The surface collection strategy applied for the survey of the eastern residential quarter was too coarse-grained to yield much functional evidence<sup>79</sup>. Still, a good insight has been obtained into the planning of this eastern residential area by combining the surface architecture with the excellent results of the magnetometer survey. From a purely topographical point of view, the south facing slopes to the east of the monumental centre of the town offered a more enjoyable view and better climatic conditions than the western domestic quarter. Consequently, this hillside may have contained the more valuable building plots, accessible to the social higher classes<sup>80</sup>. This is also suggested by the evidence of the urban mansion under excavation in the central part of the eastern domestic area. That the plot was – after having been occupied by one or more *peristylum* houses – selected for the construction of the late 4<sup>th</sup>–early 5<sup>th</sup> c. ›palatial‹ mansion, which – like its predecessors – was provided with excellent views of the mountains and the valley to the south, proves that the southern slopes continued to be very attractive for the late antique aristocracy<sup>81</sup>. Moreover, the results of the geophysical survey suggest that apart from some presumed *peristylum* houses, the housing blocks in the northern part of the eastern domestic quarter, which were divided by 3.50 to 4 m wide streets, also must have contained average sized dwellings with commercial or artisanal spaces attached to them. These smaller, less complex houses were presumably occupied by members of the middle class<sup>82</sup>. In addition, to the north and east of the eastern residential area the geophysical survey has revealed the presence of multiple kilns and workshops that formed part of the large-scale craft area<sup>83</sup>. Further eastwards, in the depression to the east of the theatre, the large Potters' Quarter of Sagalassos stretched out over an area of ca. 6 ha.

### Conclusion

In conclusion, for several years surface surveys, excavations and geophysical techniques have been yielding a general picture of living and housing at Sagalassos from the Hellenistic period into late Antiquity. The combination of these various research strategies has indicated that the development and organisation of the residential areas of the town were largely outlined in the Hellenistic and early Imperial periods, the time span under discussion during the conference, and this in close relationship with the general development and changes the city underwent as a whole. Apart from this chronological evolution, the integrated investigation at Sagalassos has revealed information on various house types ranging from elite housing, such as the Hellenistic and Imperial *peristylum* houses and the late antique urban mansion, to middle class houses, shops, including those along the main entrance streets and on the agoras, and workshops. All together this has allowed us to catch a glimpse of the living and housing of the Sagalassos inhabitants at various moments of the occupation history of the town.

<sup>79</sup> MARTENS 2005, 235–238.

<sup>80</sup> For the Pisidian town of Ariassos the surveyors noticed that the best areas with the largest houses appeared to be situated halfway up the terraced south facing slope, cf. S. MITCHELL, The Development of Classical Cities and Settlements in Late Roman Anatolia, in: Y. SEY (ed.), Housing and Settlement in Anatolia. A Historical Perspective (Istanbul 1996) 193–205 esp. 198.

<sup>81</sup> For the integration of views and vistas in late antique elite houses, cf. UYTTERHOEVEN 2007.

<sup>82</sup> For the characteristics of the late antique ›middle class house‹, which may also have been valid for the Imperial ›middle class dwelling‹, cf. S. P. ELLIS, Middle Class Houses in Late Antiquity, in: W. BOWDEN – A. GUTTERIDGE – C. MACHADO (eds.), Social and Political Life in Late Antiquity, LAA 3 (Leiden – Boston 2006) 413–437. Examples of ›middle class housing‹ are also known elsewhere in Asia Minor, e.g. the House of Bronzes at Sardis, cf. G. M. A. HANFMANN, Excavations at Sardis 1959, BASOR 157, 1960, 8–43; J. WALDEBAUM, Metalwork from Sardis, Sardis 8 (Cambridge, MA 1983).

<sup>83</sup> To the northeast and the south of this residential area relative concentrations of so-called clay ›kiln spacers‹ were found as well, which may point to a potter's activity, although these waste products may also have been reused for terracing here (MARTENS 2004, 211). The latter option is certainly presumable for the southern terraces of the eastern domestic area where large numbers of ›kiln spacers‹ were found in a stratigraphical context during the excavation of the urban mansion.

## List of Bibliographical Abbreviations

The citation follows guidelines of the German Archaeological Institute <www.dainst.org> (16.01.2009) and those of the Austrian Archaeological Institute <www.oeai.at/publik/autoren.html> (16.01.2009).

- Archaeometallurgy in Europe 2003  
BALTY – BALTY 1984  
JACOBS 2008  
KELLENS et al. 2003  
LANG-AUINGER 1996  
LA TORRE 1988  
MARTENS 2004  
MARTENS 2005  
MARTENS 2007  
MARTENS 2008a  
MARTENS accepted  
MARTENS et al. 2008  
MARTENS et al. in preparation  
MITCHELL et al. 1995  
OHLIG 2008  
POBLOME 1999  
RUMSCHEID 1998  
SINTUBIN et al. 2003  
UYTTERHOEVEN 2007  
UYTTERHOEVEN – JACOBS – KIREMITÇI 2007  
UYTTERHOEVEN – MARTENS 2008  
VANDEPUT – KÖSE 2001  
VIONIS – POBLOME – WAELEKENS in press
- Archaeometallurgy in Europe 1. International Conference, 24–26 September 2003, Milan I (Milan 2003).  
J. BALTY – J.-Ch. BALTY (eds.), *Apamée de Syrie. Bilan des recherches archéologiques 1973–1979. Aspects de l'architecture domestique d'Apamée. Actes du colloque tenu à Bruxelles les 29, 30 et 31 mai 1980, Fouilles d'Apamée de Syrie, Miscellanea 13* (Brussels 1984).  
I. JACOBS, *The Aesthetic Maintenance of Civic Space in Asia Minor from the 4<sup>th</sup> to the 7<sup>th</sup> Century AD. A Contribution to the Discussion About the ›Transformation‹ or ›Decline‹ of the Ancient City* (Ph.D. diss. Katholieke Universiteit Leuven 2008).  
N. KELLENS – P. DEGRYSE – F. MARTENS – M. WAELEKENS, *Iron Production Activities and Products at Roman to Early Byzantine Sagalassos (SW Turkey)*, in: *Archaeometallurgy in Europe 2003*, 545–554.  
C. LANG-AUINGER, *Hanghaus 1 in Ephesos. Der Baubefund, FiE 8, 3* (Vienna 1996).  
G. F. LA TORRE, *Gli impianti commerciali ed artigianali nel tessuto urbano di Pompei*, in: L. F. DELL'ORTO (ed.), *Pompei. L'informatica al servizio di una città antica* (Rome 1988) 73–102.  
F. MARTENS, *Interdisciplinary Research Concerning the Urban Development of Sagalassos. Settlement Development, Urban Layout and Infrastructure* (Ph.D. diss. Katholieke Universiteit Leuven 2004).  
F. MARTENS, *The Archaeological Urban Survey of Sagalassos (South-West Turkey). The Possibilities and Limitations of Surveying a ›non-typical‹ Classical Site*, *OxfJA* 24,3, 2005, 229–254.  
F. MARTENS, *Late Antique Urban Streets at Sagalassos*, in: L. LAVAN – E. ZANINI – A. SARANTIS (eds.), *Technology in Transition A.D. 300–650, Late Antique Archaeology 4, 1* (Leiden 2007) 321–365.  
F. MARTENS, *Urban Traffic in the Hills of the Eastern Mediterranean. The Development, Maintenance, and Usage of the Street System at Sagalassos in South-Western Turkey*, in: BALLEET et al. 2008, 191–200.  
F. MARTENS, *The Urban Development of Sagalassos. Town Planning and Settlement Evolution*, *Studies in Eastern Mediterranean Archaeology* 9 (accepted).  
F. MARTENS – H. VANHAVERBEKE – M. WAELEKENS, *Town and Suburbium of Sagalassos: An Interaction Investigated Through Survey*, in: H. VANHAVERBEKE – J. POBLOME – M. WAELEKENS – F. VERMEULEN – R. BRULET (eds.), *Thinking about Space. The Potential of Surface Survey and Contextual Analysis in the Analysis of Space in Roman Times, Studies in Eastern Mediterranean Archaeology 8* (Turnhout 2008) 127–149.  
F. MARTENS – B. MUŠIĆ – D. SIMILOX-TOHON – V. DE LAET – M. WAELEKENS, *The Eastern Residential Area of Sagalassos (SW-Turkey): A Test Case for Reconstructing Urban Development Through a Multi-strategic Approach, JfieldA* (in preparation).  
S. MITCHELL – S. CORMACK – R. FURSDON – E. J. OWENS – J. ÖZTURK, *Cremna in Pisidia. An Ancient City in Peace and in War* (London 1995).  
C. OHLIG (ed.), *Cura Aquarum in Jordania. Proceedings of the 13<sup>th</sup> International Congress on the History of Water Management and Hydraulic Engineering in the Mediterranean Region, Petra/Amman, 31 March–9 April 2007, Schriften der DWhG* (Siegburg 2008).  
J. POBLOME, *Sagalassos Red Slip Ware. Typology and Chronology, Studies in Eastern Mediterranean Archaeology 2* (Turnhout 1999).  
F. RUMSCHEID, *Priene. Führer durch das ›Pompeji Kleinasien‹* (Istanbul 1998).  
M. SINTUBIN – P. MUCHEZ – D. SIMILOX-TOHON – G. VERHAERT – E. PAULISSEN – M. WAELEKENS, *Seismic Catastrophes at the Ancient City of Sagalassos (SW Turkey) and their Implications for the Seismotectonics in the Burdur–Isparta Area, Geological Journal* 38, 2003, 359–374.  
I. UYTTERHOEVEN, *Urban Aesthetics in Late Antique Sagalassos II. The Private Urban Mansion*, in: J. N. ERZEN – P. YONCACI (eds.), *Türkiye'de estetik/Aesthetics in Turkey. Turkish Congress of Aesthetics Proceedings* (Ankara 2007) 473–488.  
I. UYTTERHOEVEN – I. JACOBS – M. KIREMITÇI, *Report on the 2005 Excavation and Restoration Campaign at Sagalassos. 1. The Domestic Area Excavation, KST 28/1, 2006* (2007) 317–319.  
I. UYTTERHOEVEN – F. MARTENS, *Private Bathing at Sagalassos (SW-Turkey) and Asia Minor*, in: OHLIG 2008, 285–300.  
L. VANDEPUT – V. KÖSE, *The 1999 Pisidia Survey at Melli, AnSt* 51, 2001, 133–145.  
A. K. VIONIS – J. POBLOME – M. WAELEKENS, *The Hidden Material Culture of the Dark Ages. Early Medieval Ceramics at Sagalassos (Turkey): New Evidence (c. AD 650–800)*, *AnSt* in press.

- WAEKENS 2002 M. WAEKENS, Romanization in the East. A Case Study: Sagalassos and Pisidia (SW Turkey), *IstMitt* 52, 2002, 311–368.
- WAEKENS et al. 2006 M. WAEKENS – H. VANHAVERBEKE – F. MARTENS – P. TALLOEN – J. POBLOME – N. KELLENS – T. PUTZEYS – P. DEGRYSE – T. VAN THUYNE – W. VAN NEER, The Late Antique to Early Byzantine City in Southwest Anatolia. Sagalassos and its Territory: A Case-Study, in: J. U. KRAUSE – C. WITSCHERL (eds.), *Die Stadt in der Spätantike – Niedergang oder Wandel?* (Stuttgart 2006) 199–255.
- WAEKENS et al. 2007 M. WAEKENS – T. PUTZEYS – I. UYTTERHOEVEN – T. VAN THUYNE – W. VAN NEER – J. POBLOME – N. KELLENS, Two Late Antique Housing Units at Sagalassos, in: L. LAVAN – L. ÖZGENEL – A. SARANTIS (eds.), *Housing in Late Antiquity. From Palaces to Shops*, Late Antique Archaeology Suppl. Series 1 (Leiden 2007) 495–514.
- WULF 1999 U. WULF, *Die Stadtgrabung 3. Die hellenistischen und römischen Wohnhäuser von Pergamon: unter besonderer Berücksichtigung der Anlagen zwischen der Mittel- und der Ostgasse*, AvP 15, 3 (Berlin–New York 1999).

### Sources of Illustrations

Figs. 1–11: I. Uytterhoeven, F. Martens, B. Mušič, M. Waelkens

*Dr. Inge Uytterhoeven*  
*Sagalassos Archaeological Research Project*  
*Katholieke Universiteit Leuven*  
*Blijde-Inkomststraat 21*  
*B–3000 Leuven*  
*Inge.Uytterhoeven@arts.kuleuven.be*

*Dr. Femke Martens*  
*Sagalassos Archaeological Research Project*  
*Katholieke Universiteit Leuven*  
*Blijde-Inkomststraat 21*  
*B–3000 Leuven*  
*Femke.Martens@arts.kuleuven.be*

*Branko Mušič*  
*Gearh d.o.o.*  
*Radvanjska 13*  
*SLO–2000 Maribor*  
*branko.music@uni-lj.si*

*Prof. Dr. Marc Waelkens*  
*Sagalassos Archaeological Research Project*  
*Katholieke Universiteit Leuven*  
*Blijde-Inkomststraat 21*  
*B–3000 Leuven*  
*Marc.Waelkens@arts.kuleuven.be*





Fig. 1: View on the urban mansion from the southwest

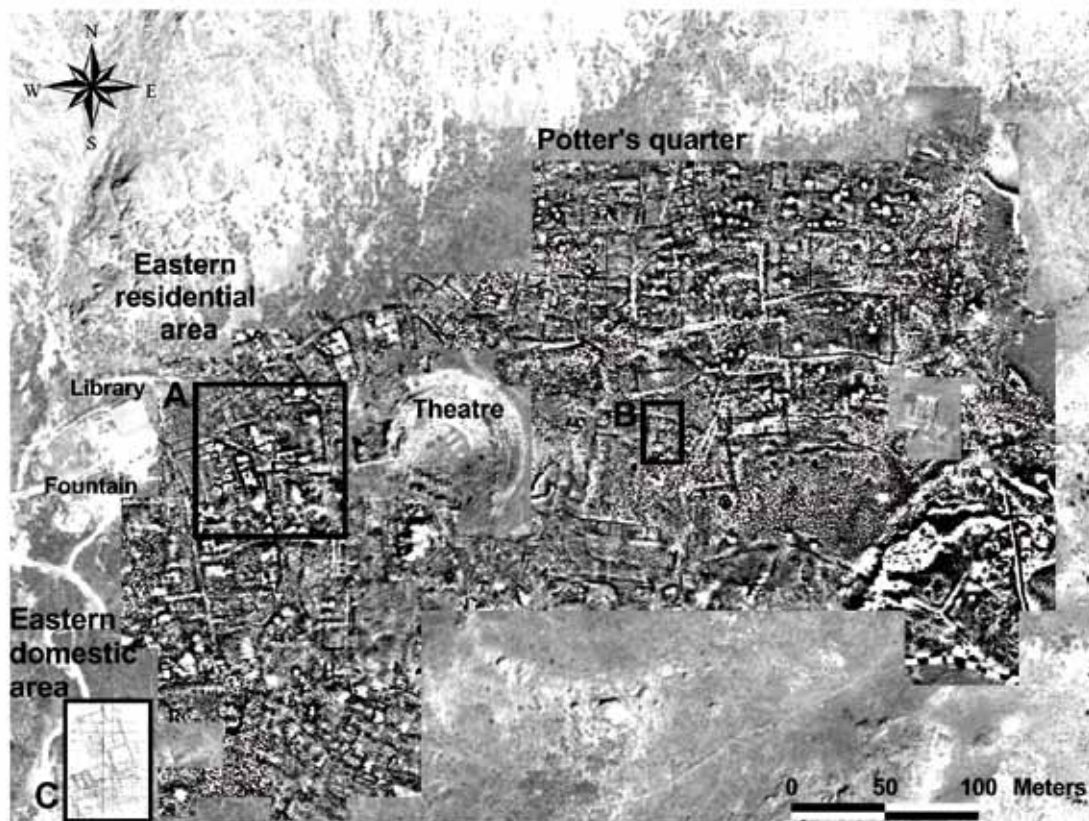


Fig. 2: Magnetic map of Eastern residential area and Potter's quarter on the QuickBird panchromatic satellite image (© 2003; Digital Globe. All rights reserved. 19.09.2003 at 8.30 AM). A and B: areas surveyed by GPR method (cf. Figs. 4 and 5); C: Eastern domestic area surveyed by GPR (cf. Fig. 6)

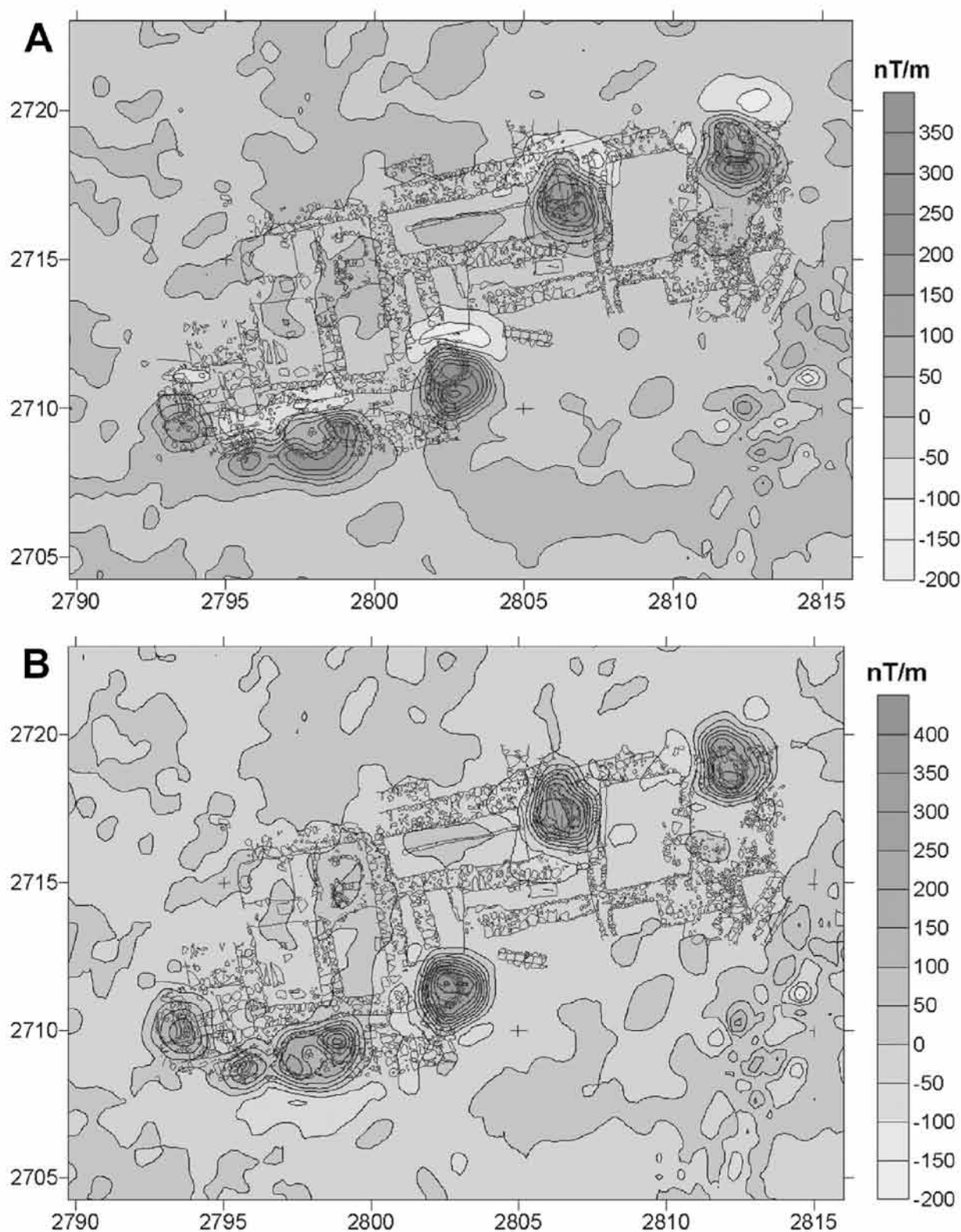


Fig. 3: The distinct bipolarity of magnetic anomalies generated by potters' kilns made of brick with a strong thermo-remnant magnetisation (TRM) (A). The bipolarity is significantly reduced or eliminated by applying a reduction-to-pole (RTP) transformation (B). The magnetic anomalies show the precise position of magnetically anomalous bodies (cf. also Fig. 2.C). Plan views of excavated potter's workshop by the Sagalassos Project



Fig. 4: Time slices diagram of GPR equal amplitude echoes at the central part of the Eastern residential area (cf. also Fig. 2. A)

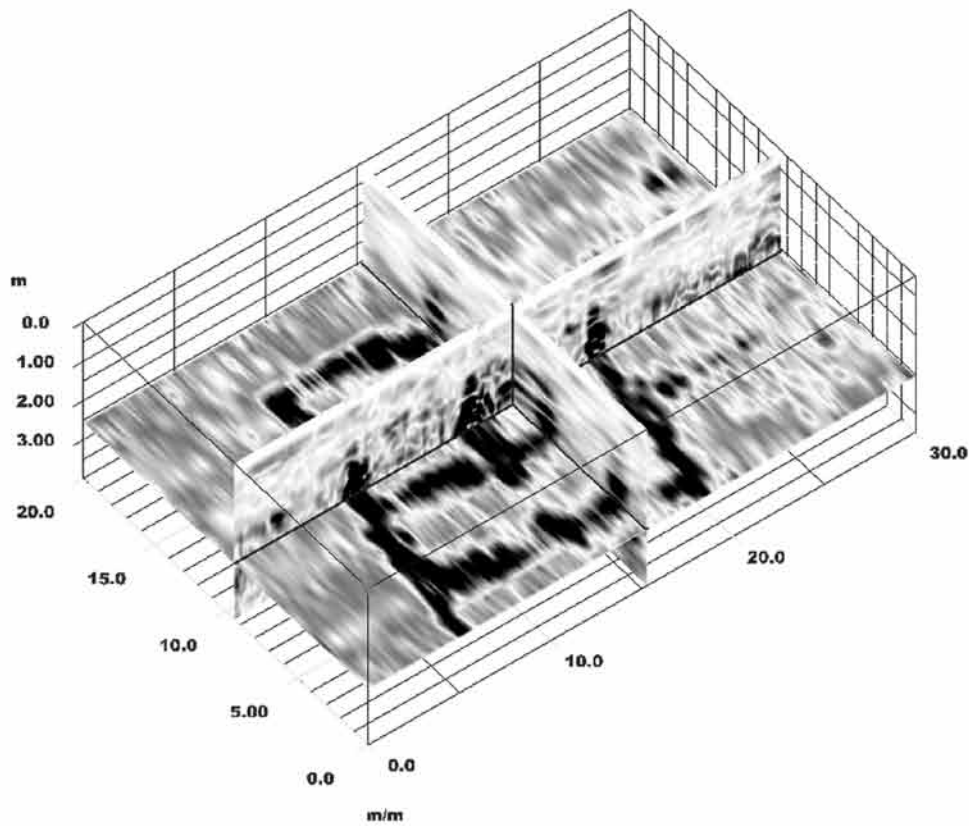


Fig. 5: 3D visualisation of GPR echoes at the area of the 'Gymnasium' (cf. also Fig. 2.B)



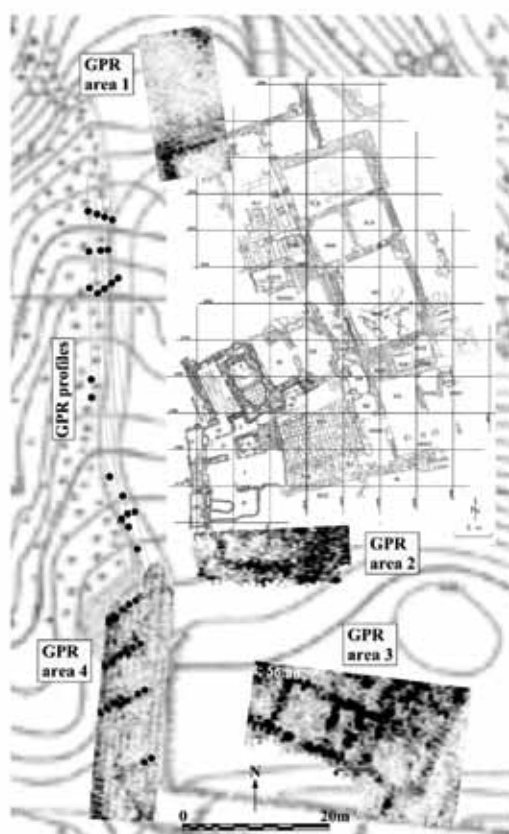


Fig. 6: Plan view of excavated walls in Eastern Domestic area (situation after the 2007 campaign) and results of GPR exploration in the near surroundings. It is evident that orientations of architectural remains are varying even in the areas very close to the city centre (cf. also fig. 2. D)



Fig. 7: View on the Western Domestic Quarter from the West

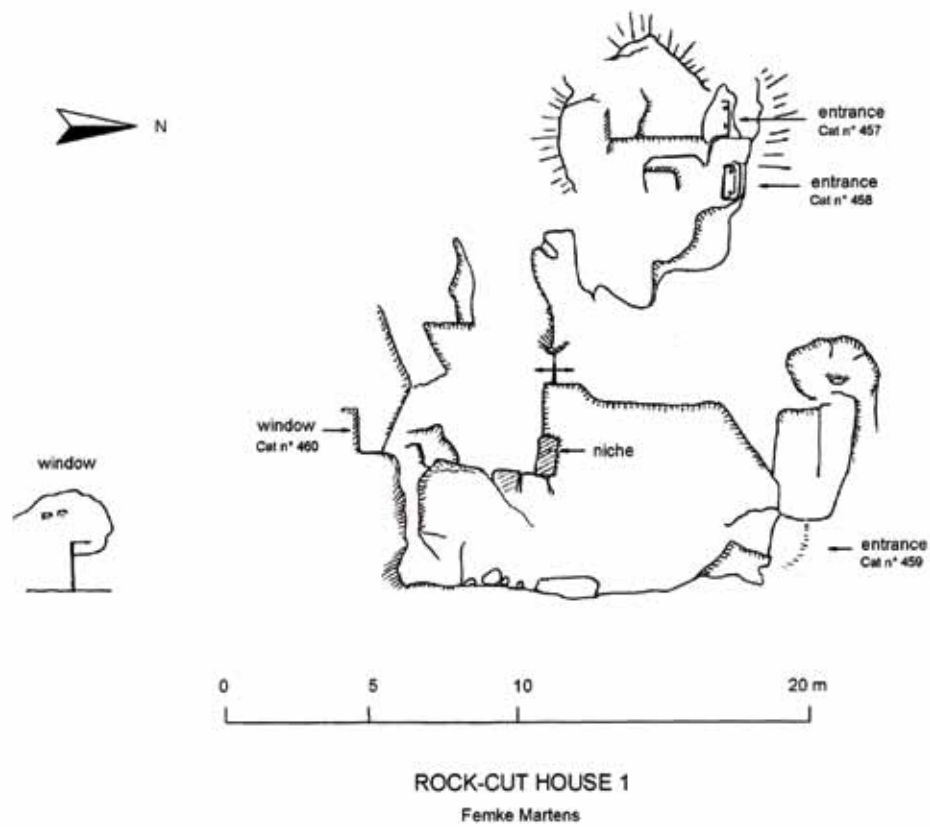


Fig. 8: Plan of Rock Cut House 1 in the Western Domestic Quarter



Fig. 9: View on the Eastern Domestic Area from the Northwest



Fig. 10: View on the peristyle courtyard of the 1st c. AD peristylum house from the Northeast

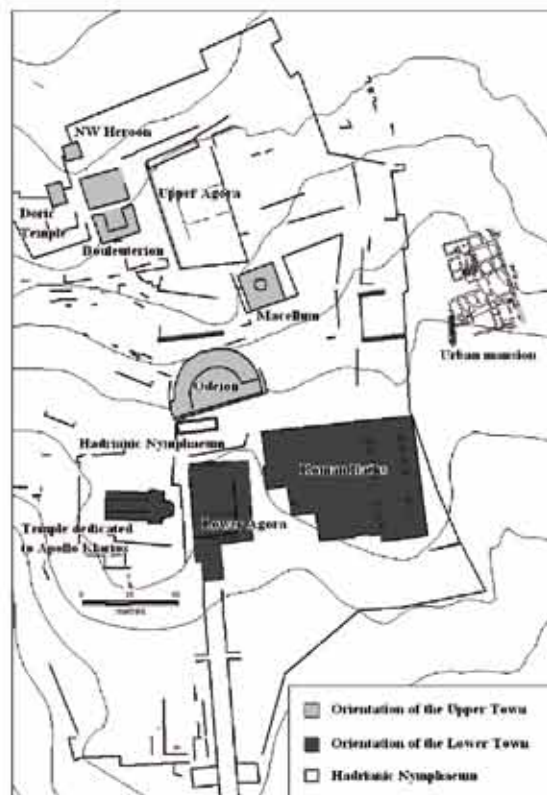


Fig. 11: Map of Sagalassos with indication of the main orientations. The late antique urban mansion enclosed parts that were oriented either according to the Upper Town orientation or in correspondence with that of the Lower Town



